Annual Report and Plan of Work
for the
Nebraska State Water Planning and Review Process

Submitted to the Governor
and Legislature by the
Director of Natural Resources

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II. INTRODUCTION

The Nebraska State Water Planning and Review Process was initiated in 1978 to redirect and accelerate Nebraska's water planning efforts. This Annual Report and Plan of Work summarizes work completed as part of that process in FY 2003 and presents a work program and budget for future fiscal years. This is a report of the Director of Natural Resources and is submitted in compliance with Nebraska Revised Statutes Sec. 2-15106. Section 2-1599 of the statutes directs that the process shall be designed to: 1) provide the Legislature and the citizens of Nebraska with information and alternative methods of addressing important water policy issues and area wide or statewide water resources problems; 2) provide coordinated interagency reviews of proposed local, state, and federal water resources programs and projects; 3) develop and maintain the data, information, and analysis capabilities necessary to provide state agencies and other water interests with a support base for water planning and management activities; 4) provide the state with the capacity to plan and design water resources projects; and 5) conduct any other planning activities necessary to protect and promote the interests of the state and its citizens in the water resources of Nebraska.

In recent years one major focus of the State Water Planning and Review Process has been on natural resources information management. Work has been closely coordinated with the work of the Data Bank Section to produce a variety of maps and other information useful in addressing the state's natural resources problems. Geographic information systems (GIS) and computer assisted data manipulation and modeling continue to be an integral part of the long range planning and management of the state's water and soil resources. The work items in this report continue to reflect that emphasis.

The State Water Planning and Review Process work items related to information management are found primarily in Section B. Some of the information management products and activities found in this report are co-products of the Department's Data Bank Section and the Planning and Assistance Division. This is a report of planning activities and includes no programmatic information about Data Bank Section initiatives other than the revision of digital elevation models and revision of digital otrthophoto quadrangles. However, the Data Bank Section does have a major role in most of the information management/basic planning activities listed. Other divisions of the Department also participate in planning activities. For instance, the Floodplain Management and Dam Safety Division conducts floodplain planning activities and the agency's Legal Counsel is the agency lead in Platte River Cooperative Agreement activities.

Planning and review process activities are organized into the major statutory planning categories listed above. Within these categories, activities are listed roughly in the order of staff time and other non-financial support required.

III. STATUS REPORT ON COMPLETED AND ONGOING WORK

A. PROVIDE INFORMATION AND ALTERNATIVE METHODS OF ADDRESSING WATER POLICY ISSUES AND AREAWIDE OR STATEWIDE WATER RESOURCES PROBLEMS

1) Platte River Cooperative Agreement Studies

On July 1, 1997 the governors of Nebraska, Colorado and Wyoming and the U.S. Secretary of Interior signed a cooperative agreement outlining a proposed basinwide recovery implementation program for endangered species in the Central Platte Basin. Roger Patterson, Director of Natural Resources, serves as the Nebraska state representative on the governing body for the agreement and Jim Cook, legal counsel for the department, serves as his alternate. The program proposes to reduce shortages to U.S. Fish and Wildlife Service "target flows" and provide additional land habitat for endangered species in the Lexington to Chapman reach of the river. The reduction in shortages to target flows is to be realized in part by: (1) operating Kingsley Dam and related facilities in Nebraska to store a portion of the inflows to Lake McConaughy as well as environmental water made available from upstream projects in an environmental account that is managed by the USFWS (this portion of the program is already in operation because of licensing requirements of the Federal Energy Regulatory Commission and releases have been made from that account starting in the summer of 2000), (2) modify Pathfinder Reservoir in Wyoming to store water in another environmental account to be similarly managed, and (3) construct and operate the Tamarack Project in Colorado; that project will utilize excess flows when available for groundwater recharge which will return to the river at times when flow shortages are more likely.

However, the three projects listed in the previous paragraph will only supply a portion of the needed average annual 130,000 to 150,000 acre feet of target flow shortage reduction. The remainder would need to be obtained through additional water conservation and water supply projects. A Water Action Plan that identifies potential projects in all three states to achieve the remaining water objective has been prepared. No projects will be implemented until additional assessments of their feasibility and impact have been completed. Those assessments will occur during the course of the program if it is, in fact, initiated.

On the land side, the proposed program would provide for 10,000 acres of suitable habitat by the end of the first thirteen year increment. Interests in land could be acquired through title, easements or leases but no eminent domain would be used. Taxes would continue to be paid on the land whether or not the record owner was tax exempt.

The primary agency work on the Cooperative Agreement has been handled through the Director of Natural Resources, the deputy director of the department andthe agency legal counsel , none of which are part of the Planning and Assistance Division. However, Planning and Assistance Division staff have frequently worked with and are expected to continue to work with each of those other staff members and others on various activities relating to the agreement.

An additional responsibility under the agreement is for each state to mitigate, offset or prevent any new depletions to the river's target flows as part of the proposed program. This

requires each state to develop a mitigation plan that will allow new uses of both surface water and hydrologically connected groundwater to begin only as long as the impacts to the target flows are offset. Nebraska's new depletion plan has been in the development stage since 1998; that work is being performed by a group of Nebraskans, most of whom represent organizations that either would be responsible for implementing the plan or constituents that would be most affected by the plan. The group is led by the Department's legal counsel. A draft of the plan has now been submitted to and reviewed in concept by the other members of the Governance Committee.. However, further work on the details of the new depletion plan will continue in FY 2004 primarily because of its close relationship to the Cooperative Hydrology Study discussed elsewhere in this document. When that work has been completed the plan will have to be approved by the other members of the Governance Committee. Regulations to implement the plan will need to be adopted by the boards of several Natural Resource Districts.

The budget adopted by the Legislature for FY 2002 and FY 2003 included funds for two studies designed to help the Governor and the state in general better understand the significance of entering into a Platte River Program once formulation of that Program is complete. The first study is a survey of land use in the Platte River Basin for 2001. That study has now been completed. A similar study also was conducted for 1997 through the Cooperative Hydrology Study. Comparison of land uses for those two years will be needed to determine the extent to which the number of irrigated acres is changing and how that is affecting flows in the Platte. A similar study will be needed for the year 2004. Those three studies will be critical to quantifying the amount of water needed to offset for depletions caused by new uses of hydrologically connected groundwater begun between July 1, 1997 and December 31, 2004. Those are the depletions for which, under the plan in its current form, the state alone will need to offset. The cost of providing those offsets is not yet known but likely will be substantial. The 2003 Legislature appropriated $200,000 for the 2004 land use inventory and for analysis of the results of that and the 1997 and 2001 inventories.

The second study originally funded in the 2002-2003 biennium was a study of the economic impact of the proposed program in Nebraska, especially the impact of the new depletion plan discussed above. The funds for that study were lost when the department budget was reduced in the 2002 legislative session. However, funds have been pledged from other sources and the Department plans to expend $15,000 of it's FY 2004 appropriation for that study.. If that study is conducted it will be by an independent contractor. The estimated cost of that study is $170,000.

The Department is also serving as the agency through which the state's financial obligations for the term of the Cooperative Agreement are met. The appropriations to the Department's predecessor, the Natural Resources Commission, for FYS 1998, 1999, and 2000 for that purpose totaled $700,000. Of the three year total, about $265,000 was expended for Nebraska's share of the Water Conservation and Supply Study conducted by Boyle Engineering, Inc. of Denver. The contract for those services terminated at the end of calendar year 2000. Each of the other two states also had contracts with Boyle and expended the same amount.

Also funded by the three states on an equal basis was a study of the channel stability of the Platte. That study, which was conducted by Parsons Engineering, Inc., had a total price tag to the states collectively of $300,000 and was deemed necessary by the states because of

concerns with preliminary federal conclusions that the channel of the Platte River on the Big Bend reach is still degrading (narrowing and deepening) and that some of the measures proposed for the Program might actually exacerbate that problem unless other new components were added to the Program. The results of that study were helpful to the states in redirecting portions of the proposed program to what the states believe is a more realistic pilot/adaptive management approach to assessing the relationship between flows, sediment and other factors on the width and depth of the Platte River channel.

The remainder of what is left of the $700,000 appropriated by the Legislature (approximately $50,000 was lost to the budget reduction process in the 2002 session) and of an additional $125,000 appropriated for FY 2004 is being used for other expenses approved by the Governance Committee. Among those expenses are the costs of the services provided by the Executive Director, Dale Strickland, a consultant from Cheyenne, Wyoming. So that the negotiated "fair shares" for the costs of the Cooperative Agreement would be provided by each party, Mr. Strickland's services are now funded 65.79% by the federal government (Department of Interior), 15.79% by Colorado, 10.53% by Nebraska, and 7.89% by Wyoming. The original deadline for the Cooperative Agreement (July 1, 2000) has been extended until September 30, 2003. An additional extension to June 30, 2005 now appears likely. During that extension, there will be ongoing expenses to be shared by the states and the federal government. However, at this time it appears that the remaining portion of the original funds previously appropriated will be adequate to pay the Nebraska portion of those expenses through FY 2005.

In FY 2004 the state will review and comment on the Programmatic Environmental Impact Statement being prepared by federal agencies in a separate process. In future fiscal years, Department staff also are expected to contribute to continued development and implementation of the state mitigation plan, contribute to advancement of projects for the water conservation and supply plan, assist in land use delineation, and help with land use and mapping. Land use analysis and planning and implementation of programs and projects for mitigation of future water uses could conceivably become a major activity for Department staff if a basinwide program is established. The extent of that work will depend upon direction from the Governor and the Legislature. It remains to be seen what portion of that Department activity will be carried out by the planning staff.

One large issue unresolved when this report was finalized is how increases in Program costs are to be divided among the federal government and the three states. Since the original Cooperative Agreement was signed, the anticipated **cash** demand for the first thirteen year increment of the Proposed Program has risen from just under $45 million to approximately $110 million. When the cash demand was estimated at $45 million, Nebraska's share of the total program cost was to be taken care of by (1) credits resulting from the Environmental Account in Lake McConaughy, (2) dedication to the Program of a large habitat area, Cottonwood Ranch, by NPPD, and (3) the $700,000 previously appropriated and discussed above. While the three states believe that increases in cost should be assumed by the federal government, a decision to that effect had not yet been made at the time this report was finalized.

2) Republican River Basin Cooperative Activities

The Department of Natural Resources has been assisting the Republican River NRDs in

the implementation phase of the Kansas vs. Nebraska and Colorado lawsuit. The Supreme Court affirmed the settlement. The Department is providing technical assistance to NRDs and will also reimburse the NRDs for some of the costs for activities that help address the needs of the Republican River Compact. These activities include installation of meters on irrigation wells, certification of irrigated acres and accounting for many small reservoirs in the basin.

3) The Platte River Cooperative Hydrology Study

The Platte River Cooperative Hydrology Study (COHYST) was a three-year cooperative effort to develop an understanding of the hydrological and geological conditions in the Platte Basin in Nebraska upstream of Columbus, Nebraska and was completed June 30, 2001. COHYST II has taken over where the original COHYST left off and will continue for another three years until June 30, 2004. That study is discussed following this description of COHYST. The goals and objects of both studies are the same and are shown below:

To accomplish their goals, a group of Nebraska interests joined together to develop necessary data, analyses, modeling, and other information which when completed will;

1. Help Nebraska to meet its obligations under the Cooperative Agreement,
2. Enable NRDs and other entities along the Platte River to provide appropriate regulation and management,
3. Provide Nebraskans with a basis to develop policy and procedures related to ground water and surface water,
4. Enable Nebraskans to analyze proposed activities of the Cooperative Agreement and/or programs in Nebraska.

Study objectives include:

1. Collecting existing data and placing into a credible/appropriate database and fill in with new data as necessary.
2. Developing preliminary models to identify data gaps.
3. Collecting and adding supplemental data as necessary to provide a credible database.
4. Developing linked, sub-regional models to cover the Platte basin in NE.
5. Establishing credible models.
6. Using models.

The Department of Natural Resources is one of the 10 project sponsors of the study. The others are the Central Platte, Twin Platte, Tri-Basin, North Platte, and South Platte and Upper Big Blue NRDs, Game and Parks Commission, Nebraska Public Power District, and Central Nebraska Public Power & Irrigation District. The cost was a total of $2.7 million for COHYST I with $1.6 million of that coming from a Nebraska Environmental Trust grant. The cost for COHYST II will be around $3.7 million with $1.4 million coming from NET funds and the remainder of about $2.3 million paid for by in-kind services of the project sponsors. Two planning staff members are putting in significant time on this project. One is a member of the technical staff coordinator's committee. That Committee drafted the work plan and advises the sponsors on technical matters. They also direct the efforts of the ground water modelers hired for this study. That member is also the programmer for the study responsible for developing routines for projecting crop and irrigation distribution back in time and historical pumpage from

that irrigation. This is all in-kind service. The other member's time has been committed to fulfill the GIS, database and web development needs of the study. COHYST II is paying for half of his salary and anything above that is in-kind service.

During the 2003 FY, much of the effort for the project went towards development and calibration of the ground water models for the COHYST area. Additionally, some effort was put into developing web-based applications so the information created and organized for the project can be disseminated over the internet. This will be one of the primary emphases in the future.

A new project that may come out of COHYST is the creation of a new dataset of a much more dense network of rainfall stations. This will be initiated in the COHYST area and if successful, it will be undertaken throughout the state through a web-based data collections system involving many volunteers in Nebraska. This will be part of an initiative started at Colorado State University called Community Collaborative Rain and Hail Study.

4) Floodplain Planning

The biggest change from FY 2002 is the fact that the Federal Emergency Management Agency (FEMA) is now allowing Flood Mitigation Assistance (FMA) funds to be used for all-hazards mitigation plans instead of just for floods. The Disaster Mitigation Act of 2000 was passed during the Clinton Administration, but is only now coming into enforcement. The Act will require communities to have an adopted all-hazards mitigation plan in place by November, 2004, or else that community will not be eligible for federal disaster mitigation assistance (Individual Assistance and Public Assistance disaster money will not be affected).

In the last year, flood mitigation plans have been completed for Milford, Ponca, Randolph, and the Cole Creek watershed in Omaha. The flood mitigation for North Platte is still in-process. The NDNR has also initiated all-hazards plans for the cities of Tecumseh and Wahoo.

We have used the Tecumseh plan as a pilot project for a new way to inventory the structures in the community and structures in the floodplain. Using existing aerial photography and ArcView Geographic Information System, the NDNR "tagged" all of the visible structures in Tecumseh, then ground-verified all of these tags. Many of the structures were out buildings, and several residential structures were missed because they were shaded by trees. However, this innovative way to inventory all of the structures in this way saved a great deal of time and money. The total estimated time to complete the entire inventory was 20 hours. An inventory of all of the structures in the city was necessary because the all-hazards planning requirements stipulate a structure count since all structures a vulnerable to tornado, high winds, and severe summer/winter storms.

An innovative way to utilize technology was also used to gather data for structures in the floodplain in Tecumseh. Using ArcView, it was possible to overlay the floodplain coverage on top of the aerial photograph of the city. This showed which properties in Tecumseh were situated in the floodplain. The NDNR completed a floodplain mapping study in Tecumseh, and the two-foot contour data for that study was used to obtain ground elevations for all floodplain structures. Through fieldwork, NDNR staff then used a Philadelphia Rod and sight level to obtain lowest entry and first floor elevation readings for each property. Total estimated time to

complete this phase was only 5 hours of office GIS work, and 3 hours for fieldwork.

The successful implementation of technology for the vulnerability analysis portion of the all-hazards mitigation plan in Tecumseh has afforded the NDNR the use of these innovative techniques for other mitigation plans. When the results for Tecumseh were presented at the Association of State Floodplain Managers conference in St. Louis in May, a great deal of interest and positive buzz was created. Going forward, technology will be used in hazard mitigation planning to a greater degree. Our technical capability has already shown that the NDNR will be leaders in this area instead of followers.

5) Water Decision Support System

A water decision support system is a product that allows managers to make better decisions by using the latest technology with the best information available to predict surface water conditions. In the past year the Department evaluated the feasibility of creating a Decision Support System for the Platte River and met with potentially interested parties. As scoped a system would likely include: 1) a long term simulation model, 2) a daily model, 3) improved data functions, and 4) a clearinghouse for current and predicted flow data. The Department has worked with the U.S. Bureau of Reclamation on potential funding. Other involved agencies have included: Nebraska Public Power District, Central Nebraska Public Power and Irrigation District, and the U.S. Fish and Wildlife Service.

It currently appears that funding constraints will limit NDNR work to a significant degree in the next few years. However, small-scale efforts will be made to improve predictive capability with existing staff. This will include: improved data collection on a more timely basis, consideration of gages needed, development and testing/use of simplified models in less complex areas such as the Lower Platte, further evaluation of DSS needs/uses in the Platte and other basins, and continued exploration of potential avenues of funding. Continued work with the Bureau of Reclamation is expected.

6) Lower Platte River and Tributaries Feasibility Study

In January 1998, agreements were signed initiating work on the Lower Platte River and Tributaries Feasibility Study. The $4.78 million study to investigate flood damage reduction and water resources problems and solutions in the Lower Platte Basin is being led by U.S. Army Corps of Engineers. In addition to the Department, cooperators include: the Lower Platte South NRD, the Papio-Missouri River NRD, the Lower Platte North NRD and the Lower Platte River Corridor Alliance. Between 1998 and 2002 the Department provided $500,000 in pass-through funding and a total of over $200,000 in in-kind services. The study is expected to be completed by September 2004. The feasibility study area includes the Platte River from Columbus to its mouth.

The study is a follow-up to an earlier reconnaissance level study and is to provide a variety of structural and non-structural options and recommendations. In addition to examining five specific structural options it has solicited public suggestions on natural resources management issues for the area and is addressing water quality, land use and public policy concerns in the watershed. Along with the Corps and the Lower Platte South NRD, the

Department acts as a co-sponsor and serves on the executive committee for the project. The Lower Platte South NRD acts as primary administrator of funds. Half of project costs are a Corps responsibility with the state and local sponsors providing 25% funding and 25% in-kind match.

The major Department staff input to this project has already occurred and the Department provided the final $125,000 of its financial obligation in late FY 2002. Future Corps work is expected to include non-structural flood mitigation planning. Work on some projects began as part of the Lower Platte Feasibility Study but has been or will be completed under other Corps authorities. Two major projects studied as part of the effort, the Western Sarpy County Levee, and the Sand Creek Project, have received Congressional approval. A scope of studies for a drinking water and wastewater study for the corridor in Saunders and Cass counties between Louisville and Lincoln has been completed.

7) Lower Platte River Corridor Alliance

The Lower Platte River Corridor Alliance is an umbrella organization of state and local agencies working to foster the development and implementation of locally drawn strategies, actions, and practices to protect, enhance or restore the vitality of the river's resources between Columbus and Plattsmouth. The major project supported by the Alliance to date has been the Lower Platte River and Tributaries Feasibility Study. However, the organization has a separate purpose from the feasibility study and has been meeting on a quarterly basis. In FY 2002, there was limited financial support of the Alliance by the Department and other state agencies. Departmental support was continued for FY 2003 and is being continued in FY 2004. This activity has taken only a very limited amount of NDNR staff time.

Alliance activities have included local water quality and flood mitigation planning activities.

8) Lower Platte Cumulative Impacts Study

The Lower Platte Cumulative Impacts Study is a joint effort to determine the cumulative impacts of development in and adjacent to the floodplain of the lower Platte River. Partners in the effort include the Lower Platte North NRD, the Lower Platte South NRD, the Papio-Missouri River NRD, the Nebraska Game and Parks Commission, the Nebraska Department of Roads, and the Nebraska Department of Natural Resources. The study will be conducted through the U.S. Army Corps of Engineers. The Department of Natural Resources has agreed to provide $1,000 worth of in-kind services for the study.

9) Environmental Education Activities

Agency environmental education activities include: 1) participation in planning and staging the Nebraska Envirothon, 2) participation in the Children's Groundwater Festival, held annually in Grand Island by the Groundwater Foundation, and 3) participation in the Earth Wellness Festival, annually held at Southeast Community College in Lincoln.

B. DEVELOP AND MAINTAIN THE DATA, INFORMATION AND ANALYSIS CAPABILITIES TO PROVIDE A SUPPORT BASE FOR WATER PLANNING AND MANAGEMENT

Basic Planning Activities provide the data base and management information necessary to plan natural resource related activities. This activity is a major function within the Department of Natural Resources. In addition to providing information to other agencies and interests, work in this activity is used to support general planning activities, administer the planning process and review projects and plans. Although future fiscal years may see an increasing emphasis on other types of planning activity, data base management and mapping activities are expected to remain a vital part of the Department's planning program.

Planning Information Base – General

The long-term goal of the information base is to develop the capability to analyze the relationships of a wide variety of information in a GIS environment. This includes data on soil characteristics, land use, surface and ground water data, geologic characteristics, climate, socio-economic characteristics, forestry characteristics, hydrology and water use. The development of statewide databases for use by state, federal, NRD and local units of government has a high priority.

The databases developed through the State Water Planning and Review process will be those with special application to water or watershed planning and activities.

Natural resources needs can be better met by increased efficiency and effective use of natural resources data. Better techniques of information acquisition, processing, storage and use are required to accomplish that task. GIS processing offers a tool for decision makers that combines multiple layers of information with the interactive capability of a relational database.

The products that will be and in some cases are being produced are as varied as the agencies that will use them. These include land use maps, soils maps, aerial photography with interpretations, multi-spectral satellite imagery, enhanced high altitude color aerial imagery, floodplain management information, water rights, well registrations, hydrologic information, and resources planning and environmental protection data. Applications of this information base can enhance state, federal and NRD management as well as city and county services and tax assessment.

NDNR's GIS efforts will continue to support the priorities of the GIS Steering Committee. The production of digital orthophoto quadrangles (DOQs) and digital elevation models (DEMs) on a statewide basis was a major agency priority completed in FY 99 and a second updated version of those DEMs was initiated in FY 2001. Among other uses, these DOQs and DEMs are being used by Department staff to help digitize soil survey maps recompiled by the Natural Resources Conservation Service and bring them up to SSURGO (Soil Survey Geographic Data Base) national standards. The work on updating DEMs-DOQs that was started in FY 2001 should help to expand the future use of these products and assist in future floodprone area mapping. In addition, NDNR work on a National Hydrographic data

set is helping address the priorities of the committee.

The NDNR actively supports the development and use of statewide databases freely available for the use of a host of government agencies. To that end, the NDNR has aggressively populated its world wide web server accessible through the Internet with easily available up-to-date information in both graphic and tabular forms.

Planning Information Base – Work Completed and Planned

1) Water Rights Mapping

The Department continues to scan water rights project maps and digitize the boundaries of land under permit. Currently there are two water divisions completed. The digitizing work for the Big Blue basin and the Big and Little Nemaha basins, water divisions 1-D and 1-F respectively, is being checked for accuracy. The Elkhorn basin and Little Blue basins are partially complete. In addition, the surface water database has been modernized and will be linked to the digital map information.

The Department has completed the installation of digital mapping software and base data in all of its field offices. Field personnel have begun using GIS and GPS technology to administer water rights. As part of this effort, the Planning and Assistance Division is assisting the Field Offices and Water Administration Division in conducting the adjudication of water rights in the Republican River basin. The improved accuracy and repeatability of digital techniques has enhanced the adjudication process.

New computer programs have been developed and deployed across the state to improve the mapping and measuring of water rights. These tools and techniques, as well as base data have been shared with several NRDs.

2) Flood Prone Area Mapping

In FY 1999 Natural Resources Commission staff developed a relatively automated process to delineate floodprone areas using recently completed digital elevation models and digital orthophoto quadrangles. This method is now being used by NDNR to develop detailed floodplain maps for the nearly half of the counties in the state that have no countywide floodplain mapping.

In FY 2003 NDNR delineated and mapped floodprone areas Johnson, Pawnee, Boyd, Knox, Perkins, Gosper, Johnson, Pawnee, Perkins, and Counties. This work is a joint effort of the Floodplain/Dam Safety Division and the Planning and Assistance Division and is paid for in part through a continuing contract with the Federal Emergency Management Agency.

3) National Hydrography Dataset

The National Hydrographic Dataset (NHD) is a dataset model developed jointly by the USGS and EPA with a goal of providing a common reference digital hydrographic dataset for a wide cross-section of applications using data related to surface water features. At 1:24,000 scale it would present water features at the same scale as other state digital mapping packages. It would also better enable spatial comparison with a wide range of other data. More importantly it would provide the basis for, or enhance the efficiency of, a wide range of potential water analysis activities

The Department of Natural Resources is coordinating development of the NHD in Nebraska. To date sufficient funding has been secured to complete only a portion of the state, although a long term goal is to complete statewide coverage. Under the current process NDNR will supervise the completion of "tagged vector hydros" for targeted watersheds. Under a workshare agreement the U.S.Geological Survey will then undertake the processing to convert those tagged vector hydros into the finished NHD product. The project is a joint effort, with funding being supplied through the Nebraska Department of Environmental Quality. Smaller past amounts were supplied through the Nebraska Information Technology Commission, the Nebraska Department of Roads, and NRD sources. Funding is utilized primarily to hire student digitizing personnel through the University of Nebraska Conservation and Survey Division. The students are then officed and supervised at NDNR.

The schedule for NDNR delivery of tagged vector hydros on past and upcoming watersheds includes:

Delivered	Salt Creek
Delivered	Lower Elkhorn
Delivered	Lower Platte
Delivered	Lower Platte – Shell
Delivered	Big Papillion – Mosquito
Delivered	Blackbird – Soldier
Delivered	Middle Big Blue
Delivered	Lower Little Blue
Delivered	Upper Big Blue
9/2003	Turkey
10/2003	West Fork Big Blue
1/2004	Upper Little Blue
5/2004	Keg-Weeping Water

4) Revision of Digital Elevation Models

In FY 2003, the Department of Natural Resources, through the Data Bank continued to develop second generation of digital elevation model (DEM) coverage for the state. As scheduled, the agency recently completed developing statewide 3.75-minute, 10-Meter interval Digital Elevation Models (DEMs), mapped to 1:12,000 scale and those products are undergoing USGS review and awaiting approval. The 10-Meter DEM database, both in UTM and State Plane coordinate system, is available on-line and interactively retrievable over the Internet through the Data Bank. The Department uses digital elevations for production of digital

orthophoto quadrangles (DOQs), flood prone area mapping, and planning purposes. The Elevation data provides information about the terrain. This is one of the framework databases that provide basic data infrastructure for a wide variety of GIS applications and geo-spatial data users.

5) Revision of Digital Orthophoto Quadrangles

In FY 2003, the Department of Natural Resources, through the Data Bank is also generating a second generation Digital Orthophoto Quadrangle (DOQ) coverage for the state. These DOQs (1-Meter resolution, 1:12,000, grayscale) are produced using 10-Meter DEMs and 1999 NAPP photography. Currently, one-third of the state is completed. The statewide coverage is targeted for completion by FY 2004. The compressed DOQs, both in UTM and State Plane coordinate system, are available on-line and interactively retrievable over the Internet through the Data Bank. These DOQs support a wide variety of applications, including development of various natural and cultural resources coverages. The Nebraska GIS Steering Committee has indicated that statewide coverage of 5 layers consisting of DOQs, soils, transportation, hydrography and land parcels is needed for Nebraska. The DOQs are important as a base map that will support the development of the other four layers. This includes use as a base map to bring soil mapping up to SSURGO national standards and to develop a National Hydrographic database (NHD) for the state. Also, the DOQs are used extensively by all levels of government for watershed planning, stream networking, and other hydrologic applications.

In FY 2004, the DNR will continue with an update of DEMs and DOQs that will use newer photography (or satellite imagery) and provide a more up-to-date database for future uses. The newer imagery is actually required for various uses, such as Federal Emergency Management Agency floodplain mapping applications.

6) Tagged Vector Cleanup

The Tagged Vector Coverage was a by-product of the DEM-DOQ development process. The files that were used for that process were converted into ArcInfo coverage to be able to show USGS 7 ½ minute quadrangle contour lines. These can be used to make finer custom grids than what is currently available. This could be characterized as producing more accurate and precise digital elevation data. This project was completed in FY 2000. The results have been used for a variety of additional projects ranging from calculating depth to water (and locating wetlands) in a joint project between the Natural Resources Commission and the Rainwater Basin Joint Venture to helping NRDs developing farm terraces. Other uses have included help in the delineation of the watershed boundaries.

Although Tagged Vector Coverage has technically been completed, there are a number of improvements in the data that should be corrected. They are very small (usually around quad boundaries) and did not affect the DOQ production so were disregarded earlier. With this ARCINFO coverage, the errors are more noticeable now and so are being corrected. This is an ongoing project that is worked on when time is available. Output uses are the same as the Tagged Vector Coverages except these coverages have improved accuracy and are

subsequently more valuable and reliable. An additional use of this product is the Flood Prone Area Mapping initiative. This was an activity that this division was actively involved in during FY 2001. A recent use involved developing new watershed boundaries to check the manual process that had been used in the past. This checking process helped confirm a decision by NDEQ to reject an application for modifying a permit to expanding a dairy farming operation in a Class A Stream drainage basin.

There is a small area of the state remaining to be completed but it is in fairly rugged terrain so will take a very long time to complete. Since this is not in a high priority area where better data is needed, it is being completed on an "as time is available" basis. This sill string out the completion of this project by years but that is not considered to be critical at this point.

7) Digitizing of Soil Surveys to SSURGO National Standards

In April 1997, the Nebraska Natural Resources Commission, the Natural Resources Conservation Service, and the University of Nebraska Conservation and Survey Division entered into an agreement to digitize Nebraska's published Soil Surveys. The overall goal of the project is to develop a digital soils base of all 93 Nebraska counties and incorporate updated surveys as they become available. Once digitized, the file can be adjusted in scale, making it easier to integrate the soils data with other geographic data. The process utilizes the DEMs and DOQs produced by the Department. Both the NDNR Planning and Assistance Division and its Data Bank participate in the process. Personnel from both the Natural Resources Conservation Service and the University of Nebraska Conservation and Survey Division are stationed at the NDNR offices to work on the project.

As of September 2003, eighty-six counties had been completed and certified, another four counties had been digitized and were awaiting certification, one was being digitized, and compilation was underway in the final two counties. In the past, NDNR has cost shared on the salary of the NRCS staff member stationed at NDNR. In FY 2003 that cost share ended, but cooperative work on the project is expected to continue. The project is expected to be completed by October 2003. At that time work will begin on correcting county joins and some other map linework as well as maintenance issues.

8) Watershed Boundary Delineation

This project has been completed for several years but has been improved several times recently as more detailed maps and information became available. A recent federal initiative requires that each state have watershed boundary delineations that meet national mapping standards. While the Watershed Boundary Delineations do not meet the national mapping standards, they are close and will be used as the basis for updating to the new standards. NDNR will be involved in the process of bringing this dataset up to standards as this project develops.

This product has been used in the Flood Prone Area Mapping initiative as well as being a valuable layer for base maps. Most surface water maps developed by the Data Bank Section staff will probably use this layer to show boundaries and flow directions by watershed. This layer can also be used to display NDNR basic units or division boundaries, DEQ water quality

stream reaches, NRCS and USGS hydrologic units, Game and Parks Commission stream fishery resource classifications and drainage areas of streamflow gage information. One of the most recent uses of the dataset has been to support the decisions of the State in a decision by NDEQ regarding the development of additional dairy operations.

10) Groundwater Level Web Data

The Department and U.S. Geological Survey have an annual agreement by which USGS produces an annual groundwater levels report and the NDNR provides limited financial support and places the material on the world wide web in an easily searchable format. Most of the agency work on the project has been provided through the Data Bank Section. However, financial support has been provided through planning funds. The effort was funded in FY2002 but beginning in FY 2003 NDNR intends to provide funding on only a biennial basis (provided adequate funds are available), with the recognition that the project itself may become biennial unless the USGS acquires additional funding sources. Therefore no NDNR funding for this effort was provided in FY 2003

C. PROJECT AND PROGRAM REVIEW ACTIVITY

This activity includes both individual reviews and service on a wide variety of review and program planning committees. It includes both smaller one time reviews of some projects and programs as well as larger longer-term types of review activity. Some of the major longer-term work activities in this category are:

- Nebraska Resources Development Fund Reviews
- Environmental Trust Advisory Committees
- Geographic Information System Steering Committee and Subcommittees
- Western Governor's Association Geographic Information System Council
- Climate Assessment and Response Committee
- Other Reviews

1) Nebraska Resources Development Fund Reviews

In FY 2003 four project proposals and three project applications/feasibility reports were reviewed. The project proposals were (1) Turkey Creek Watershed, (2) Ponca Flood Control, (3) Lower Turkey Creek Watershed and (4) Lake Wanahoo. The project applications/feasibility reports were (1)Western Sarpy/Clear Creek, (2) Skull Creek Site 31, and (3)Winslow Levee. DNR staff also provided some assistance to project sponsors during their preparation of these documents for Nebraska Resources Development Fund assistance.

2) Climate Assessment and Response Committee

The Climate Assessment and Response Committee (CARC) was active again in FY 2003 as drought conditions continued throughout much of the state for the fourth year. The western part of the state has been hit harder by drought conditions and many of the efforts of the CARC committee have been directed at that problem area. The Director of the Department of Natural Resources is a member of this committee that meets periodically and reports to the Governor. Reports are made as warranted by climatic conditions; including but not limited to problems caused by the lack of moisture; drought conditions; problems caused by excess moisture or flooding conditions; and other related activity like hail and wind storms.

One Planning and Assistance Division staff member also serves as a Co-Chair of a subcommittee of CARC; the Agricultural, Natural Resources, and Wildlife Subcommittee.

One Division staff member also serves on another subcommittee of CARC; the Moisture Availability and Outlook Committee. That subcommittee meets throughout the summer to assess conditions across the state and provide a summary of this information to the Chairman of the Climate Assessment and Response Committee.

3) Environmental Trust Committee

The Environmental Trust Board, of which the Director of Natural Resources is a member, has formed a technical advisory committee to help review grant applications. Department staff, including planning staff members, assist in project application reviews. Activity levels are expected to remain limited in upcoming fiscal years. Time commitments range from no involvement some years to several days effort other years, depending on the projects submitted to the Trust. During this past year, no staff time was needed for review of any proposed Environmental Trust projects but that will probably change in future years.

2) Geographic Information System Steering Committee and Subcommittees

The Geographic Information System Steering Committee has adopted a number of priority initiatives for GIS application in the State of Nebraska. The Department's GIS coordinators serve on the Committee. The development of digital orthophoto quadrangles (DOQs), vectorized soils databases and a high-resolution National Hydrographic database (NHD) have been identified as top areas of interest for Nebraska. The NRC developed DOQs to the U.S. Geological Survey standards and the NDNR is updating the DOQs with newer photography. NDNR is continuing the development of the digital soils database. NDNR has also committed to producing tagged vector hydros for a number of Nebraska Watersheds, and has a workshare agreement with the U.S. Geological Survey for turning those into the final National Hydrography Dataset product for those watersheds. The Lower Platte North NRD and the Lower Elkhorn NRD partnered with the NDNR to complete two watersheds. Currently the Department of Environmental Quality has joined the effort and is providing funding to keep the project on schedule. NDEQ and NDNR are hopeful that funding can continue so that we can complete the process throughout the state's watersheds and thus fulfill the GIS Steering Committee's objective.

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3) LB 1003 Water Policy Task Force

The Director of the Department of Natural Resources serves on the Water Policy Task Force created by LB 1003 (2002). The Department also administers a cash fund created for that effort. Major agency activity in support of that activity occurred during FY 2003. The task force is charged with examining issues related to Nebraska laws governing the management surface water and groundwater. It is also charged with identifying options for resolution of the issues and making recommendations to the Governor and Legislature. Issues being examined include:

1) A review of the laws of 1996, LB 108, to determine what, if any, changes are needed to adequately address Nebraska's conjunctive use management issues;

2) An evaluation of the utility of allowing temporary water transfers and, if deemed useful, development of draft legislation and procedures for authorizing and implementing a temporary water transfer law;

3) An evaluation of the utility of authorizing additional types of permanent water transfers and, if deemed useful, development of draft legislation and procedures for authorizing and implementing additional types of permanent water transfers;

4) A determination as to the usefulness of water leasing or transfers and development of a potential water banking system that would facilitate the temporary or permanent transfer of water uses; and

5) A determination as to what other ways, if any, inequities between surface water users and ground water users need to be addressed and potential actions the state could take to address such inequities.

In FY 2003 NDNR staff scheduled and coordinated meetings, developed a variety of briefing materials, maintained a task force website, used task force decisions to draft proposed legislative language, and provided overall administrative support and guidance to the task force. Task force work is scheduled to be completed by December 31, 2003.

4) Other Activity

Other Planning and Assistance Division work in basic planning activity has included the acquisition, cataloging, and maintenance of Landsat TM terrain corrected data for landuse/landcover planning activities. This data is acquired from the EROS Data Center. The NDNR has Landsat data that includes complete statewide coverage for 1991-1993 and partial coverage of the state for 1997. Recently an extensive collection of Landsat TM data for 2000 and 2001 has been acquired through the COHYST program that has greatly added to satellite data we currently have archived. The DNR has examples of this information available on it's web site and has made this data available to other federal, state, and local agencies.

We also acquired a set of Landsat MSS data from the early 1980s; this was also acquired through COHYST. This provides a historical reference from land use analysis.

D. PROVIDE THE STATE WITH THE CAPACITY TO PLAN AND DESIGN WATER PROJECTS

Although the activity has not been fully implemented, the State has participated in project planning activities through the Natural Resources Development Fund and recently through financial support for the Lower Platte River and Tributaries Feasibility study.

PLANNING & REVIEW PROCESS EXPENDITURES FY 03
AND BUDGET FYs 2004-2008

	FY2003*	FY2004	FY2005	FY 2006	FY 2007	FY 2008
Lower Platte River Alliance	$5,417	--	--	--	--	--
Intergovernmental Contract with NRCS	$9,011	--	--	--	--	--
Platte River Cooperative Agreement***	$162,603	325,000	600,000			
National Hydrography Dataset Expenses Other than DNR Staff (funded via grant or anticipated to be funded via grant)	$52,000	$54,000	$54,000	$54,000	$54,000	$54,000
Staff/Other	$739,754	$740,000	$740,000	$740,000	$740,000	$740,000
TOTAL	$968,785	$1,109,000	$1,394,000	$794,000	$794,000	$794,000

* Budgetary figures are based upon a roughly estimated combination of costs from a variety of NDNR divisions that work on state water planning and review process activities. In Fy 2002 this included about 9.6 full time equivalent positions for part of the NDNR Planning and Assistance Division and about 2.25 full time equivalent positions from other portions of NDNR. With partial exceptions, computer and office expenditures are not included in the budgetary figures. These rough estimates include only the NDNR planning related budget. Also included in the Staff-Other category is estimated expense for digitizing personnel for the National Hydrography Dataset Project. Those personnel are hired by the UNL Conservation and Survey Division, officed at NDNR, and paid with grant money NDNR receives through the Nebraska Department of Environmental Quality. For that project, computer software, hardware and budget expense are included in this budget. The budget for the Platte River Cooperative Agreement includes pass through and contract funds. This includes monies to be passed through to Natural Resources Districts for their new depletions implementation efforts as well as contract monies for a land use inventory and for other process contractual assistance. For some out-years on the NHD budget amounts are based upon anticipated grants needed to complete the project rather than actual money pledged. ** Based upon grant funds needed to complete project and anticipated but not yet obtained.